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BULLETIN
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Was Lamarck's evening primrose (*Oenothera Lamarckiana*
Seringe) a form of *Oenothera grandiflora* Solander ?

BRADLEY MOORE DAVIS

(WITH PLATES 37-39)

This paper will present evidence which in the writer's opinion clearly indicates that the *Oenothera* grown in the gardens of the Muséum d'Histoire Naturelle at Paris about 1796, described by Lamarck (?1798) under the name *Aenothera grandiflora* and renamed by Seringe (1828) *Oenothera Lamarckiana*, was a form of *Oenothera grandiflora* Solander (1789), introduced into England in 1778 from Alabama. If this identification is correct it follows that the name *Oenothera Lamarckiana* Seringe becomes a synonym of *Oenothera grandiflora* Solander (*O. grandiflora* "Aiton").

The evidence in the light of recent studies shows that Professor De Vries made an incorrect determination of the material of his cultures when he identified it with Lamarck's plant of 1796 or earlier. The material of De Vries's cultures is very different from this plant and can only be allowed to keep the name *Lamarckiana* when written "*Oenothera Lamarckiana* De Vries"; it is not *Oenothera Lamarckiana* Seringe.

My attention was first directed to this matter on seeing in the herbarium of the New York Botanical Garden tracings of Lamarck's plant, the type of *Oenothera Lamarckiana* Seringe, which is preserved in Lamarck's herbarium at the Muséum d'Histoire Naturelle. The resemblance of these tracings to the material of *Oenothera grandiflora* Solander from Alabama, now assembled in

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my own collections and at the New York Botanical Garden, was unmistakable. Miss Alice Eastwood, who kindly looked up various matters for me during her recent trip abroad, examined last winter in Paris this sheet which stands for the type of *Oenothera Lamarckiana* Seringe and reported to me her belief that it is identical with *O. grandiflora* Solander. As a result of this report I obtained through the courtesy of M. François Gagnepain negatives of this and other herbarium sheets at the Muséum d'Histoire Naturelle bearing upon the problem. M. Gagnepain further has most kindly answered a number of specific enquiries concerning the history of the specimens and certain characters of the plants not shown in the photographs. The following descriptions of these herbarium sheets are then in part from the photographs here published and in part from the notes of Miss Eastwood and M. Gagnepain, to whom I am greatly indebted.

The three sheets, to be described, were examined by Professor De Vries, who has given his interpretation (1901) in footnotes to *Die Mutationstheorie*, Vol. I, pp. 316, 317. De Vries believed that the first two sheets agreed with his cultures of *Lamarckiana*. The specimens on the third sheet he referred to *Oenothera grandiflora* Aiton (*O. suaveolens* Desfontaines) = *O. grandiflora* Solander. The conclusions of the present paper are (1) that the first sheet (PLATE 37), the type of *Oenothera Lamarckiana* Seringe, shows a remarkably well preserved and characteristic specimen of *Oenothera grandiflora* Solander, (2) that the specimen on the second sheet (PLATE 38) is neither *O. grandiflora* Solander nor "*O. Lamarckiana* De Vries" but a plant that is close to certain forms of *O. biennis*, and (3) that the two plants on the third sheet (PLATE 39), obviously stunted in growth, are so imperfect that an opinion of their identity can hardly be more than a guess. Our interest in this herbarium material centers upon the first two sheets.

SHEET 1. LAMARCK'S PLANT, WHICH STANDS AS THE TYPE OF
Oenothera Lamarckiana Seringe

This specimen (PLATE 37) is in the herbarium of Lamarck, acquired by the Muséum d'Histoire Naturelle in 1886. The sheet bears in the handwriting of Lamarck: "*Oenothera* . . . [grandiflora] . . . nova spec. flores magni lutei, odore grato, caulis

3 pedalis." The spelling of the word *Oenothera* is not clear; it might be interpreted "*Oenothera*" or possibly "*Aenothera*." This note designating a new species, *grandiflora*, in the handwriting of Lamarck establishes the specimen as what we would now designate as the type of his species *Aenothera grandiflora* described in the *Encyclopédie Méthodique Botanique* 4: 554. ?1798. This description agrees with the specimen. It seems unlikely that we shall ever know the exact date at which the description was published. Authors usually give it as 1797, but Sherborn and Woodward (1906), from evidence presented by extraneous matter bound in with certain copies of the volume concerned, place the year as ?1798. I can find no evidence that Poiret wrote the description, as was believed by De Vries, but he is known to have written later volumes of the encyclopedia.

Seringe in his diagnosis of *Oenothera Lamarckiana* (De Candolle, *Prodromus* 3: 47. 1828) gives *O. grandiflora* Lamarck as a synonym together with the comment that the species is not the *grandiflora* of Aiton. This was of course his reason for renaming the plant. The diagnosis of Seringe, as will appear later, is virtually a copy of a portion of Lamarck's description.

The following is the description of the species written by Lamarck in the *Encyclopédie Méthodique Botanique*; it should be noted that the abbreviation (V.S.) at the end of the diagnosis shows that the description was based on dried material.

"12. Onograire à grandes fleurs. *Aenothera grandiflora* (n). *Aenothera foliis integerrimis, ovato-lanceolatis; petalis integris, capsulis glabris.*

"Cette espèce paroît se rapprocher, par son port, de l'*aenothera longiflora*; mais elle en diffère par plusieurs caractères frappans, sur-tout par ses tiges rameuses, ses pétales entiers, ses fruits lisses & courts.

"Ses tiges s'élèvent à trois ou quatre pieds de hauteur. Elles sont cylindriques, munies de quelques poils rares, d'un rouge brun, divisées en rameaux nombreux, étalées. Les feuilles sont vertes, alternes, ovales, lancéolées, lisses & glabres des deux côtés, très-entières; les feuilles du bas sont pétiolées & munies de quelques dents à peine sensibles. Celles qui accompagnent les fleurs sont plus étroites, plus aiguës & sessiles.

"Les fleurs sont terminales, & forment, par leur disposition, une panicule étalée; elles sont axillaires, solitaires, mais très-

rapprochées. Le calice est jaune, muni d'un tube un peu plus long que la corolle, qui se divise en quatre folioles lancéolées, élargies à leur base, aiguës à leur sommet, terminées par un filet court, sétacé. La corolle est jaune, composée de quatre pétales ovales, très-grands, entiers, arrondis, presque aussi longs que le tube calicinal, rétrécis à leur base en forme de coin. Les anthères sont longues, linéaires. Le fruit est une capsule courte, cylindrique, glabre, tronquée, légèrement quadrangulaire, n'ayant qu'environ le tiers de longueur du tube calicinal. Cette espèce est originaire de l'Amérique septentrionale. On la cultive au jardin du Muséum d'Histoire naturelle. (V.S.)"

An interesting point has been brought to my notice by Mr. H. H. Bartlett. Poiret has this note in the *Encyclopédie Méthodique Botanique*, Suppl. 4: 141. 1816: "L'*Oenothera grandiflora*, no. 11, est la même plante que celle d'Aiton, Hort. Kew., 2, pag. 2." The designation "no. 11" instead of "no. 12" must have been a slip of the pen on Poiret's part. Although Poiret was correct in considering *O. grandiflora* Lamarck as a synonym of *O. grandiflora* Solander, he could not have had a clear conception of this plant since he kept *O. suaveolens* Desfontaines, which is also a synonym, as a distinct species.

We will give also the short diagnosis by Seringe (1828) of *Oenothera Lamarckiana* for comparison with the longer description of Lamarck.

"OE. Lamarckiana (Ser. mss.) caule ramoso, *foliis integerrimis ovato-lanceolatis*, *petalis integris magnis*, *capsulis glabris cylindrico-tetragonis brevibus*. ② in Americâ sept. OE. grandiflora Lam. dict. 4. p. 554. *non Ait. Fl. flavi."

I have italicized phrases that are the same as those in the brief introduction in the description of Lamarck, showing that Seringe had little or nothing to add to the original description.

Certain points should be noted in these descriptions of Lamarck and Seringe before we compare Lamarck's plant (PLATE 37) on the one hand with *O. grandiflora* Solander and on the other with the material of De Vries's cultures ("*O. Lamarckiana* De Vries"). The description of the petals as entire must not be emphasized, for while there may not be in these species a conspicuous notch at the tip of the petals there is usually at least a shallow indentation; the character is not one easily determined in dried specimens and

presents so much variation as to have no taxonomic value. The leaves of these species are not strictly entire but serrulate, the teeth being small and in dried material inconspicuous; the teeth are, however, shown on some of the leaves on Lamarck's plant (PLATE 37). The glabrous fruits agree best with the seed capsules of *grandiflora*, which are almost smooth, while those of De Vries's *Lamarckiana* are decidedly puberulent and pilose. Mature capsules are not shown on the specimen of Lamarck's plant, and no importance can be attached to their description as short. The reddish brown stem with occasional hairs agrees with *grandiflora*; there is no mention of numerous hairs arising from red papillae, a striking characteristic of the plants in the cultures of De Vries. The description of the leaves as glabrous is not strictly true either of *grandiflora* or of De Vries's *Lamarckiana*, both having a minute pubescence, which is more evident in the latter form. Mr. Bartlett has called my attention to the word "sétacé" in Lamarck's description of the sepal tips; this has been translated by De Vries (1901, p. 317) as "dicke." The French is, however, from the late Latin word "setaceus," derived from "seta," a stiff hair or bristle. The meaning is, then, exactly the opposite of that given by De Vries and refers to the much attenuated sepal tips, as shown in PLATE 37, a striking characteristic of *grandiflora*; the sepal tips of De Vries's *Lamarckiana* are in contrast much shorter and thicker.

It is surprising how little information is contained in the descriptions of Lamarck and Seringe that is of value in a comparison of Lamarck's original plant with *O. grandiflora* Solander and "*O. Lamarckiana* De Vries." The most important points in the writer's opinion are the description of the attenuated sepal tips and the absence of all reference to the remarkable stem coloration which is characteristic of the material of De Vries's cultures. De Vries's *Lamarckiana* invariably, so far as I am aware, presents a green stem punctate with red papillae from which long hairs arise among a short glandular pubescence. This is not noted by Lamarck, who describes the stem in agreement with *grandiflora* as reddish brown with occasional hairs.

We may now take up the consideration of the herbarium sheet of Lamarck's plant (PLATE 37) preserved in the herbarium of the

Muséum d'Histoire Naturelle. First, however, it should be noted that Buchet (1912) in a recent paper gives his opinion that this sheet agrees with *Oenothera suaveolens* Desfontaines, which he recognizes as synonymous with *Oenothera grandiflora* Solander, an older name. Buchet also regards the sheet shown on PLATE 38 from the collection of Abbé Pourret as the same form as Lamarck's plant and identifies it also with *O. suaveolens*. On this point I cannot agree, since, as will be shown later, the specimen of Abbé Pourret has important characters that distinguish it both from Lamarck's plant (*O. suaveolens* Desfontaines = *O. grandiflora* Solander) and from the material in the cultures of De Vries.

In the following account of the sheet which stands for the type of *Oenothera Lamarckiana* Seringe, are included not only the characters shown by the photograph (PLATE 37) but also others of equal or perhaps greater importance from the notes of Miss Eastwood and M. Gagnepain. In order to obtain direct comparisons with respect to the pubescence I furnished M. Gagnepain with specimens of stems and buds from both *grandiflora* and the *Lamarckiana* of De Vries's cultures, asking him to compare the specimens with Lamarck's plant but not informing him of their source.

1. STEM AND FOLIAGE. The specimen of Lamarck's plant (PLATE 37) exhibits the rather dense branching characteristic of certain forms of *grandiflora* in sharp contrast to the long sparsely branched stems of De Vries's *Lamarckiana*. The stem, according to M. Gagnepain, does not have long hairs from red papillae, as is so characteristic of De Vries's *Lamarckiana*; the pubescence is short and the stem subglabrous. The leaves are broadly elliptical or lanceolate with serrulate margins and with short but distinct petioles as in *grandiflora*; they are not sessile or almost sessile nor so broad as are the leaves of the *Lamarckiana* of De Vries. This herbarium sheet may be readily matched in the form of the branching and in the foliage by numerous specimens of *grandiflora* collected in Alabama; it represents neither the broader- nor the narrower-leaved forms in the range of variation in this species but is nearest to the intermediate condition.

2. INFLORESCENCE. The inflorescence does not present the close spike with broad-based, sessile bracts, which are so character-

istic of the younger flowering shoots of De Vries's *Lamarckiana*. On the contrary the bracts are narrow and short-petioled and the inflorescence is more open, in agreement with *grandiflora*.

3. BUDS. The buds are not stout as in the *Lamarckiana* of De Vries and the sepal tips are much more attenuate, a distinctive character of *grandiflora*. The form of the buds is exactly as in *grandiflora*, and this character is one of the most important points of agreement with this species. The pubescence on the sepals, as described by M. Gagnepain, is short; there are not present the numerous long hairs from papillae, which are characteristic of De Vries's *Lamarckiana*.

4. FLOWERS. The flowers have the very long and delicate hypanthium characteristic of *grandiflora*. Miss Eastwood reports that the petals in a bud dissected by her are entire. This is a character typical of neither *grandiflora* nor the *Lamarckiana* of De Vries, but as stated before, the petals of these forms vary so greatly in the degree of their indentation that the character has little if any taxonomic value. The length of the petals, between 3 and 4 cm., is that of *grandiflora* and also of certain forms of De Vries's *Lamarckiana*. The style extends beyond the tips of the anthers so that the lobes of the stigma (*s*, in PLATE 37) are above the latter and could not be pollinated in the bud. In these respects the flower agrees with both *grandiflora* and the large-flowered types of *Lamarckiana* in De Vries's cultures.

5. CAPSULES. There are apparently no mature capsules on the specimen, so direct comparisons are impossible. Since the size and form of a capsule depends upon the development of the ovules, i. e. upon whether or not the stigma has been fully pollinated, it is unsafe to accept statements of size unless there is evidence that sufficient material has been examined. Lamarck's statement that the capsules are short was probably based on immature or partially pollinated capsules. His description of the capsules as glabrous points to *grandiflora*; as stated before, the capsules of De Vries's *Lamarckiana* are decidedly puberulent and pilose.

The characters of *Oenothera grandiflora*, which appear on the herbarium sheet of Lamarck's plant, and those of the *Lamarckiana* of De Vries's cultures may be more readily contrasted in the following statement.

O. grandiflora Solander AND LAMARCK'S
PLANT

Flowering stems generally with numerous approximate branches.
 Stems green above, reddish brown below, the papillae at the base of long hairs colored like the stem.
 Leaves of upper foliage lanceolate, rarely broad, with distinct petioles.
 Inflorescence more open, with narrow, petioled bracts.
 Buds not stout, with much attenuated sepal tips. Sepals puberulent, sometimes sparsely pilose.
 Flowers with a long delicate hypanthium. Petals 3-3.5 cm. long. Stigma lobes above the tips of the anthers.

O. Lamarckiana FROM THE CULTURES OF
DE VRIES

Flowering stems sparsely branched or not at all.
 The papillae at the base of the long hairs colored red so that the green stem appears punctate with red dots.
 Leaves of upper foliage ovate-lanceolate, sessile or almost sessile.
 Inflorescence more close, with sessile bracts broad at the base.
 Buds stout, with shorter sepal tips. Pubescence of sepals a heavy puberulent and pilose covering.
 Flowers with a stouter hypanthium. Petals in some races 4-4.5 cm. long, in others 2.5-3 cm. long. Stigma lobes in the large-flowered types above the tips of the anthers, in the smaller-flowered forms at about the level of of the anther tips.

There is another sheet in the herbarium of the Muséum d'Histoire Naturelle which is without a name but bears in the handwriting of Lamarck: "d'Amérique sept. Tige rameuse, haute de 3 à 4 pieds." Both M. Gagnepain and Miss Eastwood report that this sheet is similar to that of Lamarck's plant which we have described above and shown on PLATE 37. The history of the sheet is apparently not known and I have no evidence that it can safely be associated with the specimen upon which Lamarck undoubtedly based his description. Nevertheless, this sheet may be closely related to or even a duplicate of the specimen that served as the type for the descriptions of Lamarck and Seringe.

In summary it may be said that the specimen, which we must consider the type of *Oenothera Lamarckiana* Seringe, presents no characters in clear form that are not those of *O. grandiflora* Solander. In not one of the contrasted characters discussed above does the specimen agree with the *Lamarckiana* of De Vries's cultures. The only points in which De Vries's *Lamarckiana* may be said to resemble this specimen are the size of the petals and the position of the stigma, which in the large-flowered forms of *Lamarckiana* is above the tips of the anthers; these are characters which *grandiflora* and De Vries's *Lamarckiana* have in common.

It is exceedingly fortunate that the plant which serves as the type of *Oenothera Lamarckiana* Seringe should have come down to us so well preserved that there is scarcely a doubt of its identity with *Oenothera grandiflora* Solander, introduced into England in 1778.

SHEET 2. A SPECIMEN OF *Oenothera* FROM THE COLLECTION OF
ABBÉ POURRET

This specimen (PLATE 38) is of interest for the reason that De Vries (1901, footnote to p. 317) believed that it as well as Lamarck's plant agreed with the material of his cultures ("*Oenothera Lamarckiana* De Vries"). Buchet (1912) has recently referred the specimen to *Oenothera suaveolens* Desfontaines = *O. grandiflora* Solander. I am unable to agree with either of these opinions and shall present evidence that the plant was close to certain forms of *Oenothera biennis*.

The sheet bears the label HERB. MUS. PARIS. with the statement at the bottom "Collection de l'Abbé Pourret, extraite de l'Herbier légué par M. le Dr. Barbier. 1847." On this label, in the handwriting of Spach are the names "*Onagra vulgaris* Spach" and "*Oenothera biennis* Linné." At the left is a list of old names representing synonymy, copied by Abbé Pourret, and below this list his clerk wrote the name *Oenothera biennis* L.

De Vries states that the plant was probably collected by Abbé Pourret in the garden of the museum at the time of his visit to Paris in 1788. M. Gagnepain, however, is not satisfied with the evidence for this view and writes that the history of the sheet is unknown to him.

An examination of the specimen itself (PLATE 38) shows the following characters.

I. STEM AND FOLIAGE. The long unbranched stem bears elliptical, petioled leaves very different from the sessile or almost sessile, broad-based leaves of De Vries's *Lamarckiana*. The absence of approximate flowering branches is against any relationship to *grandiflora*. The appearance of the small buds in the axils of the lower leaves is characteristic of some forms of *Oenothera biennis*. The pubescence of the stem is described by M. Gagnepain as very like the specimen of *grandiflora* and not at all like the specimen of De Vries's *Lamarckiana* sent for comparison.

2. INFLORESCENCE. The bracts of the inflorescence are not broad at the base and sessile as in the *Lamarckiana* of De Vries. They are narrow-elliptical and short-petioled.

3. BUDS. The size and form of the buds present perhaps the most important characters on the sheet. They are short and stout, and these characters alone make it impossible that the plant could have been *O. grandiflora* Solander. (Compare PLATE 38 with PLATE 37.) Forms of *O. biennis* frequently show these peculiarities. The sepals have a greater pubescence than those of *grandiflora*.

4. FLOWERS. The flowers are medium-sized, petals probably between 2 and 2.5 cm. long. They are not large enough for *grandiflora* or for the large-flowered forms of De Vries's *Lamarckiana*. The stigma (s, PLATE 38) appears to be at about the level of the anthers, the style not extending well beyond as in the types mentioned above. The flowers, in size and in the relation of the stigma to the anthers, agree with forms of *biennis*.

5. CAPSULES. The capsules appear to be of the *biennis* type, which is similar to that of De Vries's *Lamarckiana*.

In conclusion, the forms of the leaves and bracts distinguish this plant of Abbé Pourret from the *Lamarckiana* of De Vries's cultures. The size and form of the buds, the size of the flowers, and the position of the stigma distinguish it from *O. grandiflora* Solander as well as from the larger-flowered forms of De Vries's *Lamarckiana*. All of the characters described above are represented in the assemblage of forms included under the name *Oenothera biennis*. Since we know nothing of the rosette, general habit, and lower foliage of this plant, it is quite impossible to follow its determination further.

SHEET 3. SPECIMENS REFERRED BY DE VRIES TO *Oenothera grandiflora*

The specimens on this sheet (PLATE 39) are so imperfect and their form so abnormal that a satisfactory determination of their identity is probably impossible. De Vries (1901, footnote to p. 316) considered them to be *Oenothera grandiflora* Aiton = *O. grandiflora* Solander (*O. suaveolens* Desfontaines).

The sheet bears a label of Michaux with "Ameriq. sept." On this label in the handwriting of Desfontaines is "*Oenothera suaveolens* Hort. Paris." Above this name has been written "*Oenothera grandiflora* Poiret Encycl.," and below, Spach wrote "*Onagra vulgaris grandiflora* Spach." A second label bears the name "*Oenothera grandiflora*," probably in the handwriting of André Michaux. M. Gagnepain states that the specimens were imported as dried plants from North America. The chief interest in this sheet lies in the fact that Desfontaines evidently considered the specimens to be his own species *Oenothera suaveolens*.

Both specimens are entire plants, the smaller about 3.5 dm., the larger about 5 dm. in height. They are unbranched and obviously dwarfed. The leaves are petioled as in *grandiflora*, but those of the smaller plant are much below the average size for this species. The stigma (s, PLATE 39) shown in the flower of the smaller plant seems to be above the tips of the anthers as in *grandiflora*. The pubescence of the stems and sepals, from notes of M. Gagnepain, appears to be somewhat similar to *grandiflora*; it is not that of De Vries's *Lamarckiana*.

There appear to be no characters on these plants that might not have been those of *O. grandiflora* Solander under very unusual or abnormal conditions. There is, however, little or nothing in these specimens that is typical of *grandiflora*, and apparently nothing that determines a relationship to any other *Oenothera*. It is hardly possible that plants so different from one another grew together in the same environment and it seems more probable that they were quite unrelated. They remain to us as the flotsam of the herbarium, plants of whose precise origin and parentage we know nothing.

DISCUSSION

The reader will have noted that throughout this paper the name *Lamarckiana* has been kept strictly for the plant that has come down to us from the cultures of De Vries, a plant well known to scores of botanists and grown in numerous botanical gardens. If this paper has shown that Lamarck's plant in the gardens of Paris at about 1796 or earlier, the type of *Oenothera Lamarckiana* Seringe (1828), was a form of *Oenothera grandiflora* Solander (1789) the former name becomes a synonym of the latter. The *Oenothera*

of De Vries's cultures is left without a name or at least without the authority of Seringe. I propose, however, that the name "*Oenothera Lamarckiana* De Vries" be kept for this plant, which has been the subject of such extensive experimental study by De Vries and whose origin and behavior is a matter of such great interest to the geneticist.

The name when written "*Oenothera Lamarckiana* De Vries" is clear to all who have knowledge of the relation that this plant bears to the mutation theory. If there were evidence that "*O. Lamarckiana* De Vries" is or ever was a component of the American flora as a native species, there might be some reason to change its name. However, the evidence indicates that *Lamarckiana* has come to us greatly modified, that its parentage is far from pure, that it is in fact of hybrid origin. We are dealing with the product of the garden, and as such the plant may reasonably be exempt from a change of name that would carry endless confusion through the literature of experimental morphology. Should any taxonomist contemplate the introduction of a new name let him first ponder the inscription over the grave of William Shakespeare.

The introduction of *Oenothera grandiflora* Solander into England in 1778 marked a very important date in the development of the *Oenothera* flora over parts of Europe. This species undoubtedly holds the key to many puzzling herbarium sheets and records. Botanists do not yet realize how definite is our knowledge of this native American species and how clear is our information on its history. (See MacDougal, 1905, p. 7.)

Oenothera grandiflora Solander was discovered by William Bartram in 1776 near Tensaw, Alabama, on an expedition undertaken at the request of John Fothergill, M.D. Solander's original description in Aiton's *Hortus Kewensis*, 1789, from material grown at Kew, states that *O. grandiflora* was introduced by John Fothergill in 1778. A herbarium specimen in the British Museum from "Hort. Fothergill 1778" makes it evident that Bartram must have sent seed to Fothergill. The species still occupies its original station in Alabama, where it was rediscovered in 1904, and there is abundant herbarium material from this source; also, there are strains under cultivation by myself and others. As striking an American novelty as this large-flowered species would naturally be-

come widely distributed, which explains its presence in Paris somewhat earlier than ?1798, when Lamarck's description was published. Escaping from the gardens, the plant has been reported as growing wild at various stations in England and France. Following in the wake of its distribution to European botanical centers came the inevitable description as new species of forms derived from the original. *Oenothera suaveolens* Desfontaines and Lamarck's plant, *Oenothera Lamarckiana* Seringe, were undoubtedly such derivatives and must be considered as forms of *Oenothera grandiflora* Solander.

The identification of Lamarck's plant with *Oenothera grandiflora* Solander has very greatly modified the problem of the origin of "*Oenothera Lamarckiana* De Vries." The problem has become far more tangible. I have recently (Davis, 1911, p. 226, and 1912, p. 379) criticized adversely the evidence that has been offered to show that *Lamarckiana* was known previous to 1778 when *grandiflora* was introduced into England. With Lamarck's plant assigned to *grandiflora* we pass from the eighteenth century to periods when we may hope for more direct evidence than that furnished by the old accounts and figures.

We know that as a cultivated plant handled by seedsmen *O. Lamarckiana* first appeared about 1860, when it was placed on the market by the firm of Carter and Company of London, who state that their seed came from Texas. The identification by Lindley of these plants with *O. Lamarckiana* Seringe was undoubtedly incorrect. I have recently described and figured (Davis, 1912, p. 417) certain well preserved specimens of an *Oenothera* in the Gray Herbarium from a plant grown at Cambridge, Massachusetts, by Dr. Asa Gray in 1862. Evidence is there given which indicates that this plant held a close genetical relationship to these same cultures of Carter and Company, perhaps not more than one or two generations removed from the original plants. These specimens show characters in part those of De Vries's *Lamarckiana* and in part like *grandiflora*. If this plant grown by Dr. Gray was representative of the cultures of Carter and Company their plants must have differed from the *Lamarckiana* of today in a number of important particulars. I regard this herbarium sheet as the most important now known bearing on the problem of the origin of *Oenothera Lamarckiana*. Its relation to the writer's working hypothesis that

Lamarckiana arose as a hybrid between *biennis* and *grandiflora* has been fully discussed in the paper mentioned above.

Although Carter and Company state that they received their seed from Texas, it must be borne in mind that we have at present no confirmatory evidence that such a plant as they describe or as that represented on the sheet in the Gray Herbarium is native in the southern or southwestern United States. Here is a problem that well deserves the attention of botanists in these regions, who should make every effort to bring such a type to light that seed may be sent to the workers in the experimental gardens. If such a form grew in Texas no further back than 1860 it may surely be expected there today.

It is possible that the cultures of Carter and Company arose in England and that their association with a Texan source may have been some mistake on the part of the seedsmen. We have several accounts of large-flowered *Oenotheras* in England at dates previous to 1860. The most important and the earliest is that in Smith's English Botany (22: 1534. 1806) with the excellent figure of Sowerby. This account describes at this early date (1806) very extensive growths of an interesting form on the sand banks along the coast a few miles north of Liverpool. At the present day "*Oenothera Lamarckiana* De Vries" and variants from this type are established and flourishing over extensive tracts in the same region north of Liverpool through the sand hills of Lancashire. It is not impossible that the *Lamarckiana* of Carter and Company may have come from such regions.

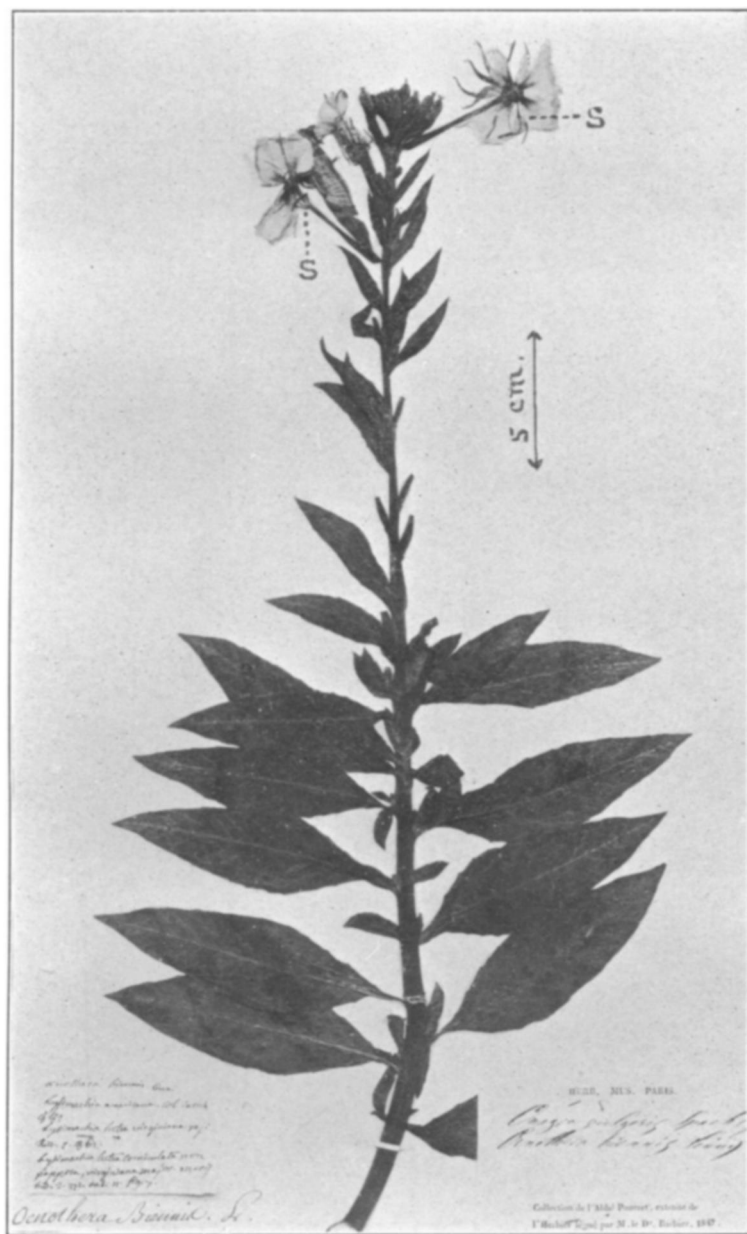
The problem of the origin of "*Oenothera Lamarckiana* De Vries" must be approached from two sides. The English botanists have the problem of the history of such an *Oenothera* flora as that of the Lancashire sand hills, and collections should be searched with the greatest thoroughness for herbarium sheets that may be of assistance in tracing its development. American botanists have the problem of the discovery and isolation by cultures of the large-flowered *Oenotheras* throughout the south and west, which might have a direct relationship to *Lamarckiana* or which might be one of the parents of a possible hybrid. A good beginning was made in the rediscovery of *Oenothera grandiflora* Solander but the search should be pushed further.

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LAMARCK'S PLANT, TYPE OF OENOTHERA LAMARCKIANA SERINGE



OENOTHERA FROM THE COLLECTION OF ABBÉ POURRET



SPECIMENS REFERRED BY DE VRIES TO OENOTHERA GRANDIFLORA